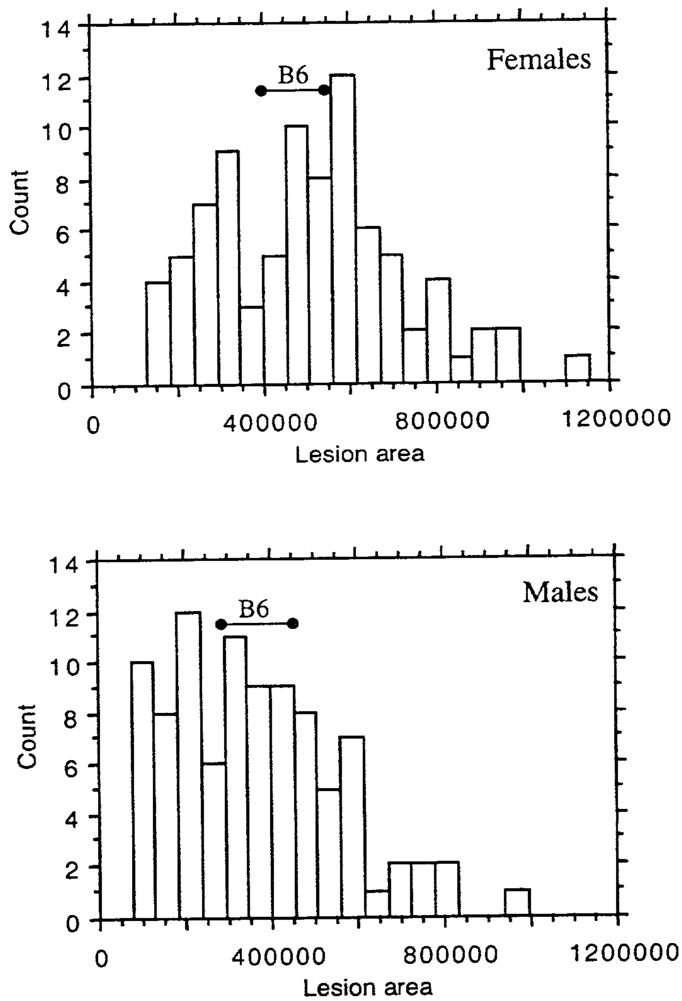
Females
B6
Count
Lesion area
0
400000
800000
1200000
0
2
4
6
8
10
12
14
Males
B6
Count
Lesion area

Figure 1

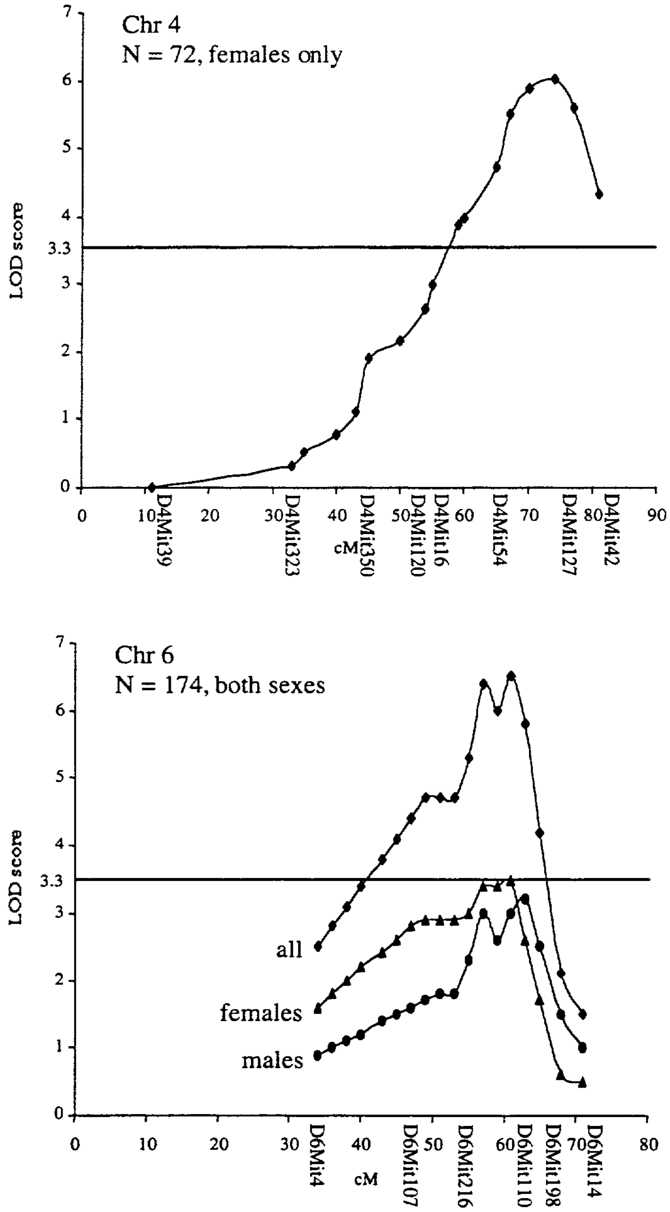
Chr 4
N = 72, females only
LOD score
cM
D4Mit39
D4Mit323
D4Mit350
D4Mit120
D4Mit16
D4Mit54
D4Mit127
D4Mit42
Chr 6
N = 174, both sexes
LOD score
all
females
males
cM
D6Mit4
D6Mit107
D6Mit216
D6Mit110
D6Mit198
D6Mit14

Figure 2

```
B-Isoform 1    1   ATGACTTTTG ATGACAAGAT GAAGCCTGCG AATGACGAGC CTGATCAGAA
M-Isoform 1    1   ATGACTTTTG ATGACAAGAT GAAGCCTGCG AATGACGAGC CTGATCAGAA
Isoform 7      1   ATGACTTTTG ATGACAAGAT GAAGCCTGCG AATGACGAGC CTGATCAGAA
Isoform 8      1   ATGACTTTTG ATGACAAGAT GAAGCCTGCG AATGACGAGC CTGATCAGAA
Isoform 9      1   ATGACTTTTG ATGACAAGAT GAAGCCTGCG AATGACGAGC CTGATCAGAA

B-Isoform 1   51   GTCATGTGGC AAGAAGCCTA AAGGTCTGCA TTTGCTTTCT TCCCCATGGT
M-Isoform 1   51   GTCATGTGGC AAGAAGCCTA AAGGTCTGCA TTTGCTTTCT TCCCCATGGT
Isoform 7     51   GTCATGTGGC AAGAAGCCTA AAG------- ---------- ----------
Isoform 8     51   GTCATGTGGC AAGAAGCCTA AAG------- ---------- ----------
Isoform 9     51   GTCATGTGGC AAGAAGCCTA AAG------- ---------- ----------
                                                                     |<-

B-Isoform 1  101   GGTTCCCTGC TGCTATGACT CTGGTCATCC TCTGCCTGGT GTTGTCAGTG
M-Isoform 1  101   GGTTCCCTGC TGCTATGACT CTGGTCATCC TCTGCCTGGT GTTGTCAGTG
Isoform 7     73   ---------- ---------- ---------- ---------- ----------
Isoform 8     73   ---------- ---------- ---------- ---------- ----------
Isoform 9     73   ---------- ---------- ---------- ---------- ----------
                   <---               TM

B-Isoform 1  151   ACCCTTATTG TACAGTGGAC ACAATTACGC CAGGTATCTG ACCTCTTAAA
M-Isoform 1  151   ACCCTTATTG TACAGTGGAC ACAATTACGC CAGGTATCTG ACCTCTTAAA
Isoform 7     73   ---------- ---------- ---------- ---------- ----------
Isoform 8     73   ---------- ---------- ---------- ---------- ----------
Isoform 9     73   ---------- ---------- ---------- ---------- ----------
                              TM             --->|

B-Isoform 1  201   ACAATACCAA GCGAACCTTA CTCAGCAGGA TCGTATCCTG GAAGGGCAGA
M-Isoform 1  201   ACAATACCAA GCGAACCTTA CTCAGCAGGA TCGTATCCTG GAAGGGCAGA
Isoform 7     73   ---------- ---------- ---------- ---------- ----------
Isoform 8     73   ---------- ---------- ---------- ---------- ----------
Isoform 9     73   ---------- ---------- ---------- ---------- ----------

B-Isoform 1  251   TGTTAGCCCA GCAGAAGGCA GAAAACACTT CACAGGAATC AAAGAAGGAA
M-Isoform 1  251   TGTTAGCCCA GCAGAAGGCA GAAAACACTT CACAGGAATC AAAGAAGGAA
Isoform 7     73   ---------- ---------- ---------- ---------- ----------
Isoform 8     73   ---------- ---------- ---------- ---------- ----------
Isoform 9     73   ---------- ---------- ---------- ---------- ----------
                                                    |<--- 1st repeat

B-Isoform 1  301   CTGAAAGGAA AGATAGACAC CCTCACCCAG AAGCTGAACG AGAAATCCAA
M-Isoform 1  301   CTGAAAGGAA AGATAGACAC CCTCACCCAG AAGCTGAACG AGAAATCCAA
Isoform 7     73   ---------- ---------- ---------- ---------- ----------
Isoform 8     73   ---------- ---------- ---------- ---------- ----------
Isoform 9     73   ---------- ---------- ---------- ---------- ----------
                                         1st repeat
```

Figure 3A

```
B-Isoform 1 351   AGAGCAGGAG GAGCTTCTAC AGAAGAATCA GAACCTCCAA GAAGCCCTGC
M-Isoform 1 351   AGAGCAGGAG GAGCTTCTAC AGAAGAATCA GAACCTCCAA GAAGCCCTGC
Isoform 7    73   ---------- ---------- ---------- ---------- ----------
Isoform 8    73   ---------- ---------- ---------- ---------- ----------
Isoform 9    73   ---------- ---------- ---------- ---------- ----------
                                        1st repeat

B-Isoform 1 401   AAAGAGCTGC AAACTCTTCA GAGGAGTCCC AGAGAGAACT CAAGGGAAAG
M-Isoform 1 401   AAAGAGCTGC AAACTCTTCA GAGGAGTCCC AGAGAGAACT CAAGGGAAAG
Isoform 7    73   ---------- ---------- -AGGAGTCCC AGAGAGAACT CAAGGGAAAG
Isoform 8    73   ---------- ---------- ---------- ---------- ----------
Isoform 9    73   ---------- ---------- ---------- ---------- ----------
                            1st repeat   --->|<---

B-Isoform 1 451   ATAGACACCA TCACCCGGAA GCTGGACGAG AAATCCAAAG AGCAGGAGGA
M-Isoform 1 451   ATAGACACCA TCACCCGGAA GCTGGACGAG AAATCCAAAG AGCAGGAGGA
Isoform 7   102   ATAGACACCA TCACCCGGAA GCTGGACGAG AAATCCAAAG AGCAGGAGGA
Isoform 8    73   ---------- ---------- ---------- ---------- ----------
Isoform 9    73   ---------- ---------- ---------- ---------- ----------
                                        2nd repeat

B-Isoform 1 501   GCTTCTGCAG ATGATTCAGA ACCTCCAAGA AGCCCTGCAG AGAGCTGCAA
M-Isoform 1 501   GCTTCTGCAG ATGATTCAGA ACCTCCAAGA AGCCCTGCAG AGAGCTGCAA
Isoform 7   152   GCTTCTGCAG ATGATTCAGA ACCTCCAAGA AGCCCTGCAG AGAGCTGCAA
Isoform 8    73   ---------- ---------- ---------- ---------- ----------
Isoform 9    73   ---------- ---------- ---------- ---------- ----------
                                        2nd repeat

B-Isoform 1 551   ACTCTTCAGA GGAGTCCCAG AGAGAACTCA AGGGAAAGAT AGACACCCTC
M-Isoform 1 551   ACTCTTCAGA GGAGTCCCAG AGAGAACTCA AGGGAAAGAT AGACACCCTC
Isoform 7   202   ACTCTTCAGA GGAGTCCCAG AGAGAACTCA AGGGAAAGAT AGACACCCTC
Isoform 8    73   ---------A GGAGTCCCAG AGAGAACTCA AGGGAAAGAT AGACACCCTC
Isoform 9    73   ---------- ---------- ---------- ---------- ----------
                    2nd ---->|<----     3rd repeat

B-Isoform 1 601   ACCTTGAAGC TGAACGAGAA ATCCAAAGAG CAGGAGGAGC TTCTACAGAA
M-Isoform 1 601   ACCTTGAAGC TGAACGAGAA ATCCAAAGAG CAGGAGGAGC TTCTACAGAA
Isoform 7   252   ACCTTGAAGC TGAACGAGAA ATCCAAAGAG CAGGAGGAGC TTCTACAGAA
Isoform 8   114   ACCTTGAAGC TGAACGAGAA ATCCAAAGAG CAGGAGGAGC TTCTACAGAA
Isoform 9    73   ---------- ---------- ---------- ---------- ----------
                                        3rd repeat

B-Isoform 1 651   GAATCAGAAC CTCCAAGAAG CCCTGCAAAG AGCTGCAAAC TTTTCAGGTC
M-Isoform 1 651   GAATCAGAAC CTCCAAGAAG CCCTGCAAAG AGCTGCAAAC TTTTCAGGTC
Isoform 7   302   GAATCAGAAC CTCCAAGAAG CCCTGCAAAG AGCTGCAAAC TTTTCAGGTC
Isoform 8   164   GAATCAGAAC CTCCAAGAAG CCCTGCAAAG AGCTGCAAAC TTTTCAGGTC
Isoform 9    73   ---------- ---------- ---------- ---------- -------GTC
                                        3rd repeat              ---->|
```

Figure 3B

```
B-Isoform 1 701    CTTGTCCACA AGACTGGCTC TGGCATAAAG AAAACTGTTA CCTCTTCCAT
M-Isoform 1 701    CTTGTCCACA AGACTGGCTC TGGCATAAAG AAAACTGTTA CCTCTTCCAT
Isoform 7   352    CTTGTCCACA AGACTGGCTC TGGCATAAAG AAAACTGTTA CCTCTTCCAT
Isoform 8   214    CTTGTCCACA AGACTGGCTT TGGCATAAAG AAAACTGTTA CCTCTTCCAT
Isoform 9    75    CTTGTCCACA AGACTGGCTC TGGCATAAAG AAAACTGTTA CCTCTTCCAT

B-Isoform 1 751    GGGCCCCTTA GCTGGGAAAA AAACCGGCAG ACCTGCCAAT CTTTGGGTGG
M-Isoform 1 751    GGGCCCTTTA GCTGGGAAAA AAACCGGCAG ACCTGCCAAT CTTTGGGTGG
Isoform 7   402    GGGCCCTTTG GCTGGGAAAA AAACCGGCAG ACCTGCCAAT CTTTGGGTGG
Isoform 8   264    GGGCCCTTTA GCTGGGAAAA AAACCGGCAG ACCTGCCAAT CTTTGGGTGG
Isoform 9   125    GGGCCCTTTA GCTGGGAAAA AAACCGGCAG ACCTGCCAAT CTTTGGGTGG

B-Isoform 1 801    CCAGTTACTA CAAATTAATG GTGCAGATGA TCTGACATTC ATCTTACAAG
M-Isoform 1 801    CCAGTTACTA CAAATTAATG GTGCAGATGA TCTGACATTC ATCTTACAAG
Isoform 7   452    CCAGTTACTA CAAATTAATG GTGCAGATGA TCTGACATTC ATCTTACAAG
Isoform 8   314    CCAGTTACTA CAAATTAATG GTGCAGATGA TCTGACATTC ATCTTACAAG
Isoform 9   175    CCAGTTACTA CAAATTAATG GTGCAGATGA TCTGACATTC ATCTTACAAG

B-Isoform 1 851    CAATTTCCCA TACCACCTCC CCGTTCTGGA TTGGATTGCA TCGGAAGAAG
M-Isoform 1 851    CAATTTCCCA TACCACCTCC CCATTCTGGA TTGGATTGCA TCGGAAGAAG
Isoform 7   502    CAATTTCCCA TACCACCTCC CCATTCTGGA TTGGATTGCA TCGGAAGAAG
Isoform 8   364    CAATTTCCCA TACCACCTCC CCATTCTGGA TTGGATTGCA TCGGAAGAAG
Isoform 9   225    CAATTTCCCA TACCACCTCC CCATTCTGGA TTGGATTGCA TCGGAAGAAG

B-Isoform 1 901    CCTGGCCAAC CATGGCTATG GGAGAATGGA ACTCCTTTGA ATTTTCAATT
M-Isoform 1 901    CCTGGCCAAC CATGGCTATG GGAGAATGGA ACTCCTTTGA ATTTTCAATT
Isoform 7   552    CCTGGCCAAC CATGGCTATG GGAGAATGGA ACTCCTTTGA ATTTTCAATT
Isoform 8   414    CCTGGCCAAC CATGGCTATG GGAGAATGGA ACTCCTTTGA ATTTTCAATT
Isoform 9   275    CCTGGCCAAC CATGGCTATG GGAGAATGGA ACTCCTTTGA ATTTTCAATT

B-Isoform 1 951    CTTTAAGACC AGGGGCGTTT CTTTACAGCT ATATTCATCA GGCAACTGTG
M-Isoform 1 951    CTTTAAGACC AGGGGCGTTT CTTTACAGCT ATATTCATCA GGCAACTGTG
Isoform 7   602    CTTTAAGACC AGGGGCGTTT CTTTACAGCT ATATTCATCA AGCAACTGTG
Isoform 8   464    CTTTAAGACC AGGGGCGTTT CTTTACAGCT ATATTCATCA GGCAACTGTG
Isoform 9   325    CTTTAAGACC AGGGGCGTTT CTTTACAGCT ATATTCATCA GGCAACTGTG

B-Isoform1 1001    CATACCTTCA AGACGGAGCT GTGTTCGCTG AAAACTGCAT TCTAATTGCA
M-Isoform1 1001    CATACCTTCA AGACGGAGCT GTGTTCGCTG AAAACTGCAT TCTAATTGCA
Isoform 7   652    CATACCTTCA AGACGGAGCT GTGTTCGCTG AAAACTGCAT TCTAATTGCA
Isoform 8   514    CATACCTTCA AGACGGAGCT GTGTTCGCTG AAAACTGCAT TCTAATTGCA
Isoform 9   375    CATACCTTCA AGACGGAGCT GTGTTCGCTG AAAACTGCAT TCTAATTGCA

B-Isoform1 1051    TTCAGCATAT GTCAGAAGAA GACAAATCAT TTGCAAATTT AG--------
M-Isoform1 1051    TTCAGCATAT GTCAGAAGAA GACAAATCAT TTGCAAATTT AG--------
Isoform 7   702    TTCAGCATAT GTCAGAAGAA GACAAATCAT TTGCAAATTT AG--------
Isoform 8   564    TTCAGCATAT GTCAGAAGAA GACAAATCAT TTGCAAATTT AG--------
Isoform 9   425    TTCAGCATAT GTCAGAAGAA GACAAATCAT TTGCAAATTT AG--------
```

Figure 3C

Isoform 1

```
atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat cag      48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1               5                   10                  15

aag tca tgt ggc aag aag cct aaa ggt ctg cat ttg ctt tct tcc cca      96
Lys Ser Cys Gly Lys Lys Pro Lys Gly Leu His Leu Leu Ser Ser Pro
            20                  25                  30

tgg tgg ttc cct gct gct atg act ctg gtc atc ctc tgc ctg gtg ttg      144
Trp Trp Phe Pro Ala Ala Met Thr Leu Val Ile Leu Cys Leu Val Leu
        35                  40                  45

tca gtg acc ctt att gta cag tgg aca caa tta cgc cag gta tct gac      192
Ser Val Thr Leu Ile Val Gln Trp Thr Gln Leu Arg Gln Val Ser Asp
    50                  55                  60

ctc tta aaa caa tac caa gcg aac ctt act cag cag gat cgt atc ctg      240
Leu Leu Lys Gln Tyr Gln Ala Asn Leu Thr Gln Gln Asp Arg Ile Leu
65                  70                  75                  80

gaa ggg cag atg tta gcc cag cag aag gca gaa aac act tca cag gaa      288
Glu Gly Gln Met Leu Ala Gln Gln Lys Ala Glu Asn Thr Ser Gln Glu
                85                  90                  95

tca aag aag gaa ctg aaa gga aag ata gac acc ctc acc cag aag ctg      336
Ser Lys Lys Glu Leu Lys Gly Lys Ile Asp Thr Leu Thr Gln Lys Leu
            100                 105                 110

aac gag aaa tcc aaa gag cag gag gag ctt cta cag aag aat cag aac      384
Asn Glu Lys Ser Lys Glu Gln Glu Glu Leu Leu Gln Lys Asn Gln Asn
        115                 120                 125

ctc caa gaa gcc ctg caa aga gct gca aac tct tca gag gag tcc cag      432
Leu Gln Glu Ala Leu Gln Arg Ala Ala Asn Ser Ser Glu Glu Ser Gln
    130                 135                 140

aga gaa ctc aag gga aag ata gac acc atc acc cgg aag ctg gac gag      480
Arg Glu Leu Lys Gly Lys Ile Asp Thr Ile Thr Arg Lys Leu Asp Glu
145                 150                 155                 160

aaa tcc aaa gag cag gag gag ctt ctg cag atg att cag aac ctc caa      528
Lys Ser Lys Glu Gln Glu Glu Leu Leu Gln Met Ile Gln Asn Leu Gln
                165                 170                 175

gaa gcc ctg cag aga gct gca aac tct tca gag gag tcc cag aga gaa      576
Glu Ala Leu Gln Arg Ala Ala Asn Ser Ser Glu Glu Ser Gln Arg Glu
            180                 185                 190

ctc aag gga aag ata gac acc ctc acc ttg aag ctg aac gag aaa tcc      624
Leu Lys Gly Lys Ile Asp Thr Leu Thr Leu Lys Leu Asn Glu Lys Ser
        195                 200                 205

aaa gag cag gag gag ctt cta cag aag aat cag aac ctc caa gaa gcc      672
Lys Glu Gln Glu Glu Leu Leu Gln Lys Asn Gln Asn Leu Gln Glu Ala
    210                 215                 220
```

Figure 4A

Isoform 1

```
ctg caa aga gct gca aac ttt tca ggt cct tgt cca caa gac tgg ctc       720
Leu Gln Arg Ala Ala Asn Phe Ser Gly Pro Cys Pro Gln Asp Trp Leu
225                 230                 235                 240

tgg cat aaa gaa aac tgt tac ctc ttc cat ggg ccc ttt agc tgg gaa       768
Trp His Lys Glu Asn Cys Tyr Leu Phe His Gly Pro Phe Ser Trp Glu
                245                 250                 255

aaa aac cgg cag acc tgc caa tct ttg ggt ggc cag tta cta caa att       816
Lys Asn Arg Gln Thr Cys Gln Ser Leu Gly Gly Gln Leu Leu Gln Ile
            260                 265                 270

aat ggt gca gat gat ctg aca ttc atc tta caa gca att tcc cat acc       864
Asn Gly Ala Asp Asp Leu Thr Phe Ile Leu Gln Ala Ile Ser His Thr
        275                 280                 285

acc tcc cca ttc tgg att gga ttg cat cgg aag aag cct ggc caa cca       912
Thr Ser Pro Phe Trp Ile Gly Leu His Arg Lys Lys Pro Gly Gln Pro
    290                 295                 300

tgg cta tgg gag aat gga act cct ttg aat ttt caa ttc ttt aag acc       960
Trp Leu Trp Glu Asn Gly Thr Pro Leu Asn Phe Gln Phe Phe Lys Thr
305                 310                 315                 320

agg ggc gtt tct tta cag cta tat tca tca ggc aac tgt gca tac ctt      1008
Arg Gly Val Ser Leu Gln Leu Tyr Ser Ser Gly Asn Cys Ala Tyr Leu
                325                 330                 335

caa gac gga gct gtg ttc gct gaa aac tgc att cta att gca ttc agc      1056
Gln Asp Gly Ala Val Phe Ala Glu Asn Cys Ile Leu Ile Ala Phe Ser
            340                 345                 350

ata tgt cag aag aag aca aat cat ttg caa att tag                      1092
Ile Cys Gln Lys Lys Thr Asn His Leu Gln Ile
        355                 360
```

Figure 4B

Isoform 2

```
atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat cag      48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1               5                   10                  15

aag tca tgt ggc aag aag cct aaa ggt ctg cat ttg ctt tct tcc cca      96
Lys Ser Cys Gly Lys Lys Pro Lys Gly Leu His Leu Leu Ser Ser Pro
            20                  25                  30

tgg tgg ttc cct gct gct atg act ctg gtc atc ctc tgc ctg gtg ttg      144
Trp Trp Phe Pro Ala Ala Met Thr Leu Val Ile Leu Cys Leu Val Leu
        35                  40                  45

tca gtg acc ctt att gta cag tgg aca caa tgatcgtatc ctggaagggc        194
Ser Val Thr Leu Ile Val Gln Trp Thr Gln
    50                  55

agatgttagc ccagcagaag gcagaaaaca cttcacagga atcaaagaag gaactgaaag    254

gaaagataga caccctcacc cagaagctga acgagaaatc caaagagcag gaggagcttc    314

tacagaagaa tcagaacctc caagaagccc tgcaaagagc tgcaaactct tcagaggagt    374

cccagagaga actcaaggga aagatagaca ccatcacccg gaagctggac gagaaatcca    434

aagagcagga ggagcttctg cagatgattc agaacctcca agaagccctg cagagagctg    494

caaactcttc agaggagtcc cagagagaac tcaagggaaa gatagacacc ctcaccttga    554

agctgaacga gaaatccaaa gagcaggagg agcttctaca gaagaatcag aacctccaag    614

aagccctgca aagagctgca aactttttcag gtccttgtcc acaagactgg ctctggcata   674

aagaaaactg ttacctcttc cgtgggccct ttactgggaa aaaagccggc agacctgcca    734

atctttgggt ggcagttact acaaattaat gggcagatg                           773
```

Figure 5

Isoform 3

```
atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat cag      48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1               5                   10                  15

aag tca tgt ggc aag aag cct aaa ggt ctg cat ttg ctt tct tcc cca      96
Lys Ser Cys Gly Lys Lys Pro Lys Gly Leu His Leu Leu Ser Ser Pro
            20                  25                  30

tgg tgg ttc cct gct gct atg act ctg gtc atc ctc tgc ctg gtg ttg      144
Trp Trp Phe Pro Ala Ala Met Thr Leu Val Ile Leu Cys Leu Val Leu
        35                  40                  45

tca gtg acc ctt att gta cag tgg aca caa tta cgc cag gta tct gac      192
Ser Val Thr Leu Ile Val Gln Trp Thr Gln Leu Arg Gln Val Ser Asp
    50                  55                  60

ctc tta aaa caa tac caa gcg aac ctt act cag cag gat cgt atc ctg      240
Leu Leu Lys Gln Tyr Gln Ala Asn Leu Thr Gln Gln Asp Arg Ile Leu
65                  70                  75                  80

gaa ggg cag atg tta gcc cag cag aag gca gaa aac act tca ccg caa      288
Glu Gly Gln Met Leu Ala Gln Gln Lys Ala Glu Asn Thr Ser Pro Gln
                85                  90                  95

tca aag aag gaa ctg aaa gga aag ata gac acc ctc acc cag aag ctg      336
Ser Lys Lys Glu Leu Lys Gly Lys Ile Asp Thr Leu Thr Gln Lys Leu
            100                 105                 110

aac gag aaa tcc aaa gag cag gag gag ctt cta cag aag aat cag aac      384
Asn Glu Lys Ser Lys Glu Gln Glu Glu Leu Leu Gln Lys Asn Gln Asn
        115                 120                 125

ctc caa gaa gcc ctg caa aga gct gca aac tct tca gag gag tcc cag      432
Leu Gln Glu Ala Leu Gln Arg Ala Ala Asn Ser Ser Glu Glu Ser Gln
    130                 135                 140

aga gaa ctc aag gga aag ata gac acc ctc acc ttg aag ctg aac gag      480
Arg Glu Leu Lys Gly Lys Ile Asp Thr Leu Thr Leu Lys Leu Asn Glu
145                 150                 155                 160

aaa tcc aaa gag cag                                                  495
Lys Ser Lys Glu Gln
                165
```

Figure 6

Isoform 4

```
atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat cag      48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1               5                   10                  15

aag tca tgt ggc aag aag cct aaa ggt ctg cat ttg ctt tct tcc cca      96
Lys Ser Cys Gly Lys Lys Pro Lys Gly Leu His Leu Leu Ser Ser Pro
            20                  25                  30

tgg tgg ttc cct gct gct atg act ctg gtc atc ctc tgc ctg gtg ttg     144
Trp Trp Phe Pro Ala Ala Met Thr Leu Val Ile Leu Cys Leu Val Leu
        35                  40                  45

tca gtg acc ctt att gta cag tgg aca caa tta cgc cag gta tct gac     192
Ser Val Thr Leu Ile Val Gln Trp Thr Gln Leu Arg Gln Val Ser Asp
    50                  55                  60

ctc tta aaa caa tac caa gcg aac ctt act cag cag gat cgt atc ctg     240
Leu Leu Lys Gln Tyr Gln Ala Asn Leu Thr Gln Gln Asp Arg Ile Leu
65                  70                  75                  80

gaa ggg cag atg tta gcc cag cag aag gca gaa aac act tca cag gaa     288
Glu Gly Gln Met Leu Ala Gln Gln Lys Ala Glu Asn Thr Ser Gln Glu
                85                  90                  95

tca aag aag gaa ctg aaa gga aag ata gac acc ctc acc cag aag ctg     336
Ser Lys Lys Glu Leu Lys Gly Lys Ile Asp Thr Leu Thr Gln Lys Leu
            100                 105                 110

aac gag aaa tcc aaa gag cag gag gag ctt cta cag aag aat cag aac     384
Asn Glu Lys Ser Lys Glu Gln Glu Glu Leu Leu Gln Lys Asn Gln Asn
        115                 120                 125

ctc caa gaa gcc ctg caa aga gct gca aac ttt tca ggt cct tgt cca     432
Leu Gln Glu Ala Leu Gln Arg Ala Ala Asn Phe Ser Gly Pro Cys Pro
    130                 135                 140

caa gac tgg ctc tgg cat aaa gaa aac tgt tac ctc ttc cat ggg ccc     480
Gln Asp Trp Leu Trp His Lys Glu Asn Cys Tyr Leu Phe His Gly Pro
145                 150                 155                 160

ttt agc tgg gaa aaa aac cgg cag acc tgc caa tct ttg ggt ggc cag     528
Phe Ser Trp Glu Lys Asn Arg Gln Thr Cys Gln Ser Leu Gly Gly Gln
                165                 170                 175

tta cta caa att aat ggt gca gat gat ctg aca ttc atc tta caa gca     576
Leu Leu Gln Ile Asn Gly Ala Asp Asp Leu Thr Phe Ile Leu Gln Ala
            180                 185                 190

att tcc cat acc acc tcc ccg ttc tgg att gga ttg cat cgg aag         621
Ile Ser His Thr Thr Ser Pro Phe Trp Ile Gly Leu His Arg Lys
        195                 200                 205
```

Figure 7

Isoform 5

```
atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat gag        48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Glu
1               5                   10                  15

aag tca tgt ggc aag aag cct aaa ggt ctg cat ttg ctt tct tcc cca        96
Lys Ser Cys Gly Lys Lys Pro Lys Gly Leu His Leu Leu Ser Ser Pro
            20                  25                  30

tgg tgg ttc cct gct gct atg act ctg gtc atc ctc tgc ctg gtg ttg       144
Trp Trp Phe Pro Ala Ala Met Thr Leu Val Ile Leu Cys Leu Val Leu
        35                  40                  45

tca gtg acc ctt att gta cag tgg aca caa tgatcgtatc ctggaagggc         194
Ser Val Thr Leu Ile Val Gln Trp Thr Gln
    50                  55

agatgttagc ccagcagaag gcagaaaaca cttcacagga atcaaagaag gaactgaaag   254

gaaagataga caccctcacc cagaagctga acgactccaa agagcaggag gagctacacc   314

ccccccgaac ctccaagaag ccctgcaaag agctgcaaac tcttcaggtc cttgtccaca   374

agactggctc tggcataaag aaaactgtta cctcttccat gggcccttta gctgggaaaa   434

aaaccggcag acctgccaat ctttgggtgg gcagttacta caaattaatg gtgcagatga   494

tctgacattc atcttacaag caatttccca taccacctcc ccttcttgga ttggattgca   554

tcggaagaag cctggcaacc atgggtatgg gagaatggac ttctttgaat tttaattttt   614

aagacagggc gtttttacag tttttcataa ggacttgtga tacttagagg gctgggttcg   674

ttgaaatgat tctattggtt agcatgtaga aaaaaatt
```

Figure 8

Isoform 6

atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat cag 48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1 5 10 15

aag tca tgt ggc aag aag cct aaa ggt ctg cat ttg ctt tct tcc cca 96
Lys Ser Cys Gly Lys Lys Pro Lys Gly Leu His Leu Leu Ser Ser Pro
20 25 30

tgg tgg ttc cct gct gct atg act ctg gtc atc ctc tgc ctg gtg ttg 144
Trp Trp Phe Pro Ala Ala Met Thr Leu Val Ile Leu Cys Leu Val Leu
35 40 45

tca gtg acc ctt att gta cag tgg aca caa taggagtccc agagagaact 194
Ser Val Thr Leu Ile Val Gln Trp Thr Gln
50 55

caagggaaag atagacaccc tcaccttgaa gctgaacgag aaatccaaag agcaggagga 254

gcttctacag aagaatcaga acctccaaga agccctgcaa agagctgcaa acttttcagg 314

tccttgtcca caagactggc tctggcataa agaaaactgt tacctcttcc atgggccctt 374

tagctgggaa aaaaaccggc agacctgcca atctttgggt ggccagttac tacaaattaa 434

tggtgcagat gatctgacat tcatcttaca agcaatttcc cataccacct ccccgttctg 494

gattggattg catcggaaga agcctggcca accatggcta tgggagaatg gaactccttt 554

gaatttttcaa ttctttaaga ccaggggcgt ttctttacag ctatattcat caggcaactg 614

tgcatacctt caagacggac tgtgttcgct gaaaactgca ttctaattgc attcagcata 674

tgtcaaaaga agacaaatca tttgcaaatt tagtgaatct aaagaat 721

Figure 9

Isoform 7

```
atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat cag       48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1               5                   10                  15

aag tca tgt ggc aag aag cct aaa gag gag tcc cag aga gaa ctc aag       96
Lys Ser Cys Gly Lys Lys Pro Lys Glu Glu Ser Gln Arg Glu Leu Lys
            20                  25                  30

gga aag ata gac acc atc acc cgg aag ctg gac gag aaa tcc aaa gag      144
Gly Lys Ile Asp Thr Ile Thr Arg Lys Leu Asp Glu Lys Ser Lys Glu
        35                  40                  45

cag gag gag ctt ctg cag atg att cag aac ctc caa gaa gcc ctg cag      192
Gln Glu Glu Leu Leu Gln Met Ile Gln Asn Leu Gln Glu Ala Leu Gln
    50                  55                  60

aga gct gca aac tct tca gag gag tcc cag aga gaa ctc aag gga aag      240
Arg Ala Ala Asn Ser Ser Glu Glu Ser Gln Arg Glu Leu Lys Gly Lys
65                  70                  75                  80

ata gac acc ctc acc ttg aag ctg aac gag aaa tcc aaa gag cag gag      288
Ile Asp Thr Leu Thr Leu Lys Leu Asn Glu Lys Ser Lys Glu Gln Glu
                85                  90                  95

gag ctt cta cag aag aat cag aac ctc caa gaa gcc ctg caa aga gct      336
Glu Leu Leu Gln Lys Asn Gln Asn Leu Gln Glu Ala Leu Gln Arg Ala
            100                 105                 110

gca aac ttt tca ggt cct tgt cca caa gac tgg ctc tgg cat aaa gaa      384
Ala Asn Phe Ser Gly Pro Cys Pro Gln Asp Trp Leu Trp His Lys Glu
        115                 120                 125

aac tgt tac ctc ttc cat ggg ccc ttt ggc tgg gaa aaa aac cgg cag      432
Asn Cys Tyr Leu Phe His Gly Pro Phe Gly Trp Glu Lys Asn Arg Gln
    130                 135                 140

acc tgc caa tct ttg ggt ggc cag tta cta caa att aat ggt gca gat      480
Thr Cys Gln Ser Leu Gly Gly Gln Leu Leu Gln Ile Asn Gly Ala Asp
145                 150                 155                 160

gat ctg aca ttc atc tta caa gca att tcc cat acc acc tcc cca ttc      528
Asp Leu Thr Phe Ile Leu Gln Ala Ile Ser His Thr Thr Ser Pro Phe
                165                 170                 175

tgg att gga ttg cat cgg aag aag cct ggc caa cca tgg cta tgg gag      576
Trp Ile Gly Leu His Arg Lys Lys Pro Gly Gln Pro Trp Leu Trp Glu
            180                 185                 190

aat gga act cct ttg aat ttt caa ttc ttt aag acc agg ggc gtt tct      624
Asn Gly Thr Pro Leu Asn Phe Gln Phe Phe Lys Thr Arg Gly Val Ser
        195                 200                 205

tta cag cta tat tca tca agc aac tgt gca tac ctt caa gac gga gct      672
Leu Gln Leu Tyr Ser Ser Ser Asn Cys Ala Tyr Leu Gln Asp Gly Ala
    210                 215                 220

gtg ttc gct gaa aac tgc att cta att gca ttc agc ata tgt cag aag      720
Val Phe Ala Glu Asn Cys Ile Leu Ile Ala Phe Ser Ile Cys Gln Lys
225                 230                 235                 240

aag aca aat cat ttg caa att tag                                      744
Lys Thr Asn His Leu Gln Ile

                245
```

Figure 10

Isoform 8

```
atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat cag      48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1               5                   10                  15

aag tca tgt ggc aag aag cct aaa gag gag tcc cag aga gaa ctc aag      96
Lys Ser Cys Gly Lys Lys Pro Lys Glu Glu Ser Gln Arg Glu Leu Lys
            20                  25                  30

gga aag ata gac acc ctc acc ttg aag ctg aac gag aaa tcc aaa gag      144
Gly Lys Ile Asp Thr Leu Thr Leu Lys Leu Asn Glu Lys Ser Lys Glu
        35                  40                  45

cag gag gag ctt cta cag aag aat cag aac ctc caa gaa gcc ctg caa      192
Gln Glu Glu Leu Leu Gln Lys Asn Gln Asn Leu Gln Glu Ala Leu Gln
    50                  55                  60

aga gct gca aac ttt tca ggt cct tgt cca caa gac tgg ctt tgg cat      240
Arg Ala Ala Asn Phe Ser Gly Pro Cys Pro Gln Asp Trp Leu Trp His
65                  70                  75                  80

aaa gaa aac tgt tac ctc ttc cat ggg ccc ttt agc tgg gaa aaa aac      288
Lys Glu Asn Cys Tyr Leu Phe His Gly Pro Phe Ser Trp Glu Lys Asn
                85                  90                  95

cgg cag acc tgc caa tct ttg ggt ggc cag tta cta caa att aat ggt      336
Arg Gln Thr Cys Gln Ser Leu Gly Gly Gln Leu Leu Gln Ile Asn Gly
            100                 105                 110

gca gat gat ctg aca ttc atc tta caa gca att tcc cat acc acc tcc      384
Ala Asp Asp Leu Thr Phe Ile Leu Gln Ala Ile Ser His Thr Thr Ser
        115                 120                 125

cca ttc tgg att gga ttg cat cgg aag aag cct ggc caa cca tgg cta      432
Pro Phe Trp Ile Gly Leu His Arg Lys Lys Pro Gly Gln Pro Trp Leu
    130                 135                 140

tgg gag aat gga act cct ttg aat ttt caa ttc ttt aag acc agg ggc      480
Trp Glu Asn Gly Thr Pro Leu Asn Phe Gln Phe Phe Lys Thr Arg Gly
145                 150                 155                 160

gtt tct tta cag cta tat tca tca ggc aac tgt gca tac ctt caa gac      528
Val Ser Leu Gln Leu Tyr Ser Ser Gly Asn Cys Ala Tyr Leu Gln Asp
                165                 170                 175

gga gct gtg ttc gct gaa aac tgc att cta att gca ttc agc ata tgt      576
Gly Ala Val Phe Ala Glu Asn Cys Ile Leu Ile Ala Phe Ser Ile Cys
            180                 185                 190

cag aag aag aca aat cat ttg caa att tag                              606
Gln Lys Lys Thr Asn His Leu Gln Ile
        195                 200
```

Figure 11

Isoform 9

```
atg act ttt gat gac aag atg aag cct gcg aat gac gag cct gat cag      48
Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1               5                   10                  15

aag tca tgt ggc aag aag cct aaa ggt cct tgt cca caa gac tgg ctc      96
Lys Ser Cys Gly Lys Lys Pro Lys Gly Pro Cys Pro Gln Asp Trp Leu
            20                  25                  30

tgg cat aaa gaa aac tgt tac ctc ttc cat ggg ccc ttt agc tgg gaa      144
Trp His Lys Glu Asn Cys Tyr Leu Phe His Gly Pro Phe Ser Trp Glu
        35                  40                  45

aaa aac cgg cag acc tgc caa tct ttg ggt ggc cag tta cta caa att      192
Lys Asn Arg Gln Thr Cys Gln Ser Leu Gly Gly Gln Leu Leu Gln Ile
    50                  55                  60

aat ggt gca gat gat ctg aca ttc atc tta caa gca att tcc cat acc      240
Asn Gly Ala Asp Asp Leu Thr Phe Ile Leu Gln Ala Ile Ser His Thr
65                  70                  75                  80

acc tcc cca ttc tgg att gga ttg cat cgg aag aag cct ggc caa cca      288
Thr Ser Pro Phe Trp Ile Gly Leu His Arg Lys Lys Pro Gly Gln Pro
                85                  90                  95

tgg cta tgg gag aat gga act cct ttg aat ttt caa ttc ttt aag acc      336
Trp Leu Trp Glu Asn Gly Thr Pro Leu Asn Phe Gln Phe Phe Lys Thr
            100                 105                 110

agg ggc gtt tct tta cag cta tat tca tca ggc aac tgt gca tac ctt      384
Arg Gly Val Ser Leu Gln Leu Tyr Ser Ser Gly Asn Cys Ala Tyr Leu
        115                 120                 125

caa gac gga gct gtg ttc gct gaa aac tgc att cta att gca ttc agc      432
Gln Asp Gly Ala Val Phe Ala Glu Asn Cys Ile Leu Ile Ala Phe Ser
    130                 135                 140

ata tgt cag aag aag aca aat cat ttg caa att tag                      468
Ile Cys Gln Lys Lys Thr Asn His Leu Gln Ile
145                 150                 155
```

Figure 12

```
A.
Isoform 1 (R1)  ESKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANSSE
Isoform 1 (R2)  ESQRELKGKIDTITRKLDEKSKEQEELLQMIQNLQEALQRAANSSE
Isoform 1 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
Isoform 3 (R1)  QSKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANSSE
Isoform 3 (R3)  ESQRELKGKIDTLTLKLNEKSKEQ...
Isoform 4 (R1)  ESKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANFSG
Isoform 7 (R2)  ESQRELKGKIDTITRKLDEKSKEQEELLQMIQNLQEALQRAANSSE
Isoform 7 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
Isoform 8 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
                 -  -------- - -- -----------  ----------- -

B.
Isoform 1 (R1)  ESKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANSSE
Isoform 3 (R1)  QSKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANSSE
Isoform 4 (R1)  ESKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANFSG
                 ----------------------------------------- -

C.
Isoform 1 (R2)  ESQRELKGKIDTITRKLDEKSKEQEELLQMIQNLQEALQRAANSSE
Isoform 7 (R2)  ESQRELKGKIDTITRKLDEKSKEQEELLQMIQNLQEALQRAANSSE
                ---------------------------------------------

D.
Isoform 1 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
Isoform 3 (R3)  ESQRELKGKIDTLTLKLNEKSKEQ...
Isoform 7 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
Isoform 8 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
                ---------------------------------------------

E.
Isoform 1 (R1)  ESKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANSSE
Isoform 1 (R2)  ESQRELKGKIDTITRKLDEKSKEQEELLQMIQNLQEALQRAANSSE
Isoform 1 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
Isoform 3 (R1)  QSKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANSSE
Isoform 3 (R3)  ESQRELKGKIDTLTLKLNEKSKEQ...
Isoform 4 (R1)  ESKKELKGKIDTLTQKLNEKSKEQEELLQKNQLQEALQRAANFSG
Isoform 7 (R2)  ESQRELKGKIDTITRKLDEKSKEQEELLQMIQNLQEALQRAANSSE
Isoform 7 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
Isoform 8 (R3)  ESQRELKGKIDTLTLKLNEKSKEQEELLQKNQLQEALQRAANFSG
human           ESENELKEMIETLARKLNEKSKEQMELHHQNLNQETLKRVANCSA
                 -  ---  - -   -- ------ --    ---- - -- -- -
```

Figure 13

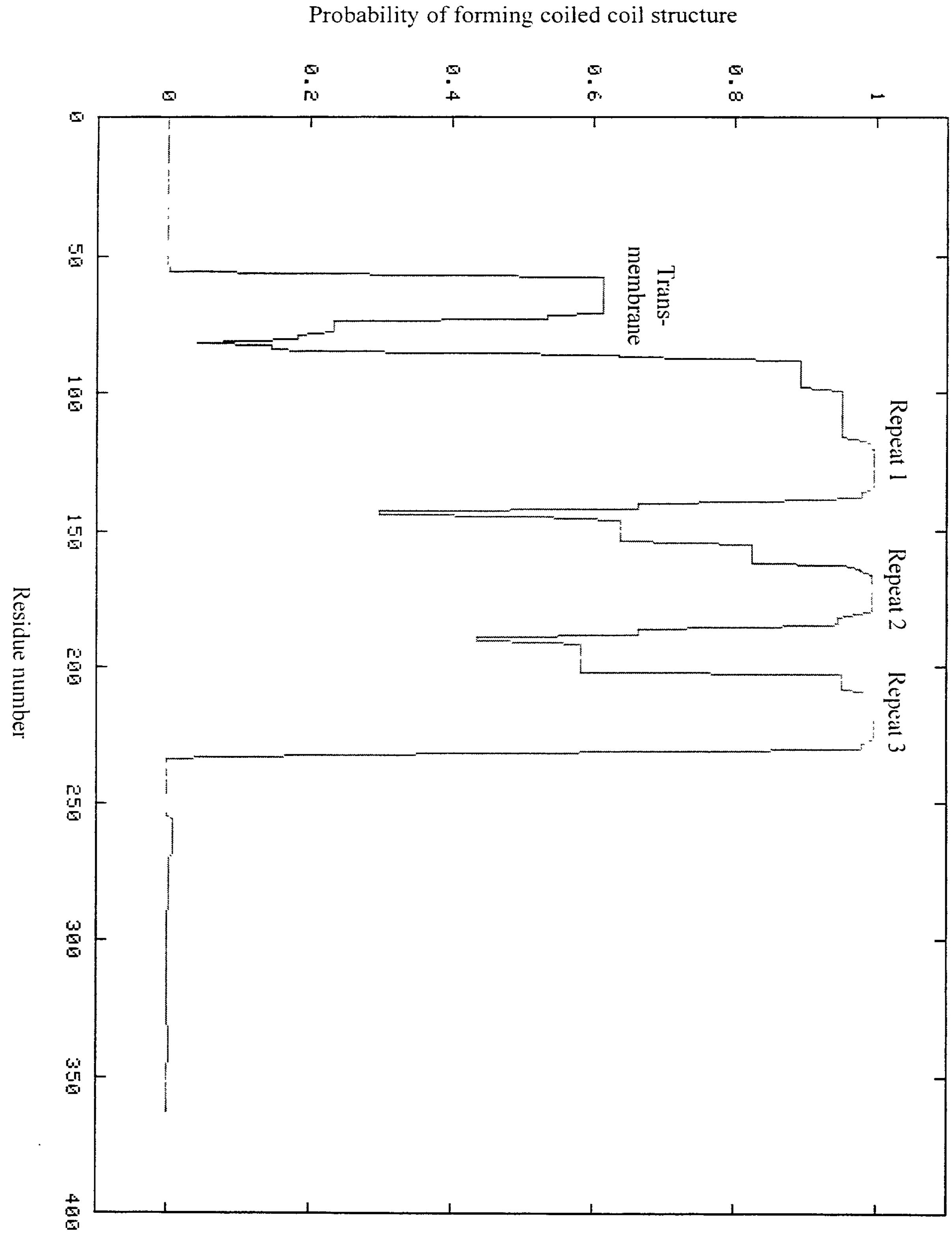
Probability of forming coiled coil structure
0
0.2
0.4
0.6
0.8
1
Trans-
membrane
Repeat 1
Repeat 2
Repeat 3
0
50
100
150
200
250
300
350
400
Residue number

Figure 14